

PURCHASE DESCRIPTION

ANALYZER, LAN/WAN

AN1LW-A

- 1.0 **GENERAL** This procurement requires a protocol analyzer capable of analyzing both Local Area Networks (LAN) and Wide Area Networks (WAN).
- 2.0 **CLASSIFICATION** In accordance with Class 3 of MIL-PRF-28800() for shipboard applications.
- 3.0 **OPERATIONAL REQUIREMENTS** The equipment shall be capable of monitoring LAN/WAN traffic and reporting of LAN/WAN activity. The equipment shall also be capable of generating traffic to exercise a network. The equipment shall be procured in each of the following configurations:

Configuration A:

- (1) LAN/Ethernet, Token-Ring
- (2) LAN/Ethernet, Token-Ring, FDDI

Configuration B:

- (1) WAN/LAN/Ethernet, Token-Ring
- (2) WAN/LAN/Ethernet, Token-Ring, FDDI

All configurations will share a set of common platform. The unique characteristics of each configuration are identified. For configuration B the equipment shall provide the capability to monitor LAN and WAN traffic simultaneously while configured in a LAN/WAN dual port attachment. All of the specifications for LAN and WAN shall also be applicable to the LAN/WAN dual port attachment except where it is otherwise noted.

- 3.1 **Monitoring** The equipment in configuration A shall monitor and display LAN traffic and display statistics of network activity. The equipment in configuration B shall monitor and display LAN and WAN traffic. The equipment shall provide the capability to capture and analyze data and shall also be capable of decoding and displaying all headers and data packets in ASCII, hexadecimal or plain english as selected by the user. The displayed data shall be color-coded to distinguish between data and different layers of protocols.
- 3.1.1 Data Capture: The equipment shall capture network traffic in real-time as well as permit storage of captured traffic to hard disk.
- 3.1.1.1 Capture Buffer:
- 3.1.1.1.1 LAN: The equipment shall provide a capture buffer of a minimum of 8 MB. The equipment shall permit the user to select either a wraparound mode or stop when the capture buffer is full. The equipment shall provide the capability to save the capture buffer to a file on the hard disk. An end-to-end buffer scroll capability shall be provided.

- 3.1.1.1.2 WAN: The equipment shall provide a minimum capture buffer size of 8 MB that shall be expandable to at least 30 MB. The equipment shall permit the user to select either a wraparound mode or stop when the capture buffer is full. The equipment shall provide the capability to save the capture buffer to a file on the hard disk. An end-to-end buffer scroll capability shall be provided.
- 3.1.1.2 Filters:
 - 3.1.1.2.1 LAN: The equipment shall provide programmable data filters. The data filters shall allow the user to selectively capture traffic data by protocol type, network addresses, frame types, pattern match, and by errors. The equipment shall provide the option to enter the filter definition via the keyboard. A pattern shall include all of the headers and a portion of data field of a packet. The equipment shall provide pre-capture and/or post-capture filter selection.
 - 3.1.1.2.2 WAN: The equipment shall provide programmable data filters. The filters shall allow the user to selectively capture traffic data by protocols, direction of transmission (DTE, DCE), pattern match with a minimum length of 64 bytes, and by errors. The equipment shall provide the option to enter the filter definition via the keyboard. The equipment shall provide pre-capture and/or post-capture filter selection.
- 3.1.1.3 Triggers:
 - 3.1.1.3.1 LAN: The equipment shall provide programmable triggers to either start or stop data capture. The triggers shall be programmable to trigger by network addresses, frame types, and by errors.
 - 3.1.1.3.2 WAN: The equipment shall provide programmable triggers to either start or stop data capture. The triggers shall be programmable to trigger by protocols, direction of transmission (DTE, DCE), pattern match with a minimum length of 64 bytes, and by errors. The equipment shall provide the user the option to enter the trigger definition via the keyboard.
- 3.1.1.4 Alert events:
 - 3.1.1.4.1 LAN: The equipment shall provide programmable alert events to notify the user of significant events occurrences. When an alert event occurs it shall be logged to a file to allow later examination. The alert event shall be programmable by event and by threshold. Programmable events shall include, as a minimum, errors.
 - 3.1.1.4.2 WAN: No alert events required.
- 3.1.2 Analysis: The equipment shall permit detailed examination of captured data. The user shall have the capability to select the level of detail to which a single frame is examined.
- 3.1.2.1 Nodes:

names for every active node on a network segment. This capability is not required for configuration B while configured in a LAN/WAN dual port attachment.
- 3.1.2.2 Statistics: The capabilities specified in this section are not required for configuration B while configured in a LAN/WAN dual port attachment.
 - 3.1.2.2.1 LAN: The equipment shall be capable of displaying statistics of network performance on realtime data. The equipment shall provide the capability to either display statistics of network performance on data collected in the capture buffer or save realtime statistics to file for later examination. The statistics shall be displayed graphically as histograms. The minimum statistics required are percentage of network bandwidth utilization, percentage of bandwidth utilization by protocol, percentage of bandwidth utilization by node, total frames, and errors. Statistics on percentage of network bandwidth utilization by protocol is not required for FDDI.

- 3.1.2.2.2 WAN: The equipment shall be capable of displaying statistics of network performance on realtime data and data collected in the capture buffer. The statistics shall be displayed at least in tabular format. The minimum statistics are link utilization, frame count, good frames, and bad frames.
- 3.1.2.3 Errors: The equipment shall be capable of identifying and reporting both network related and data related errors. The capabilities specified in this section are not required for configuration B while configured in a LAN/WAN dual port attachment.
 - 3.1.2.3.1 LAN: The errors shall include, but are not limited to, collisions, runts, jabbers, short frames, long frames, invalid frame check sequence, aborts frames, congestions, and beacons.
 - 3.1.2.3.2 WAN: The errors shall include, but are not limited to, abort frames, invalid frame check sequence, and bipolar violations.
- 3.1.2.4 Decoding: The equipment shall be capable of interpreting, decoding, and reporting in plain english, ASCII, and hexadecimal, as a minimum, up to the transport layer of the OSI model.
 - 3.1.2.4.1 Protocols: As a minimum, the protocol stacks shall be decoded, as follows:
 - 3.1.2.4.1.1 LAN: TCP/IP, DECNet, AppleTalk, Banyan VINES, XNS, Novell, and ISO.
 - 3.1.2.4.1.2 WAN: X.25, Frame Relay, HDLC, SDLC, PPP, asynchronous, and encapsulated LAN protocols.
 - 3.1.2.4.2 Data: The equipment shall provide the user with the capability to decode and display data packets in plain english, ASCII, or hexadecimal.
- 3.2 Traffic Generation The equipment shall be capable of generating traffic using various protocols, data byte sizes, and data rates. The equipment shall provide the user the capability to edit the frames to be transmitted. The equipment shall provide an editing capability, such that frames can be built from the keyboard.
 - 3.2.1 Protocols: The equipment shall be capable of generating traffic with all protocols that it is capable of decoding except asynchronous.
 - 3.2.2 Frame size: The equipment shall be capable of generating traffic with the frame size programmable within the bounds defined for each frame type. The characters of the first 78 bytes of a frame shall be definable by the user; the rest of the frame shall be defined by the user or filled in with a predefined pattern.
 - 3.2.3 Data rate:
 - 3.2.3.1 LAN:
 - 3.2.3.1.1 Ethernet: The equipment shall be capable of generating traffic at a data rate programmable from 0% to at least 80% of the 10 Mbps ethernet network bandwidth.
 - 3.2.3.1.2 Token-Ring: The equipment shall be capable of generating traffic at a data rate programmable from 0% to at least 50% of the 4 Mbps and 16 Mbps of token-ring network bandwidth.
 - 3.2.3.1.3 FDDI: The equipment shall be capable of generating traffic at a data rate programmable from 0% to at least 64% of the 100 Mbps FDDI network bandwidth.
 - 3.2.3.2 WAN: The equipment shall be capable of generating traffic at a data rate programmable from 50 bps to 1.544 Mbps synchronous.

- 3.3 BERT The equipment shall provide the capability to perform Bit Error Rate Tests (BERT) in synchronous and isochronous modes. The equipment shall report, as a minimum, bit errors and errored seconds.
 - 3.3.1 Generator clock: The equipment shall provide the capability to select a clock source from DTE or DCE. The transmission clock rate shall be in the range from 50 Hz to 1.544 MHz for synchronous.
 - 3.3.2 Test pattern: The equipment shall provide the capability to select test pattern as a pseudorandom pattern with the length ranged from 63 bits to at least 4095 bits. The equipment shall also provide the capability to select a test pattern of all 1's, all 0's, an alternating pattern of 1 and 0, and a user-defined pattern.
 - 3.3.3 Error injection: The equipment shall provide the capability to insert errors in the test data stream. The error injection rate shall be selectable as a ratio of data bit, such as one error at intervals of one every 10^2 , 10^4 , 10^5 , or 10^7 bits.
- 3.4 Software
 - 3.4.1 User interface: The equipment shall provide a Graphical User Interface (GUI) as a minimum with either a pull down or scroll up and down menu-driven style.
 - 3.4.2 Terminal emulation: The equipment shall provide a terminal emulation software so that it can be remotely controlled by another identical unit or an IBM compatible computer via modem or network connection.
 - 3.4.3 Software upgrade: The equipment shall have the software upgraded to the latest version available on the commercial market throughout the life of the contract at no additional cost.
- 3.5 Platform The equipment shall utilize a minimum of a 486DX based embedded controller with a clock speed of at least 33 MHz. The controller shall include a minimum of 540 MB of internal hard disk storage and either removable or external 540 MB hard disk capability. The equipment shall include a 3.5 inch 1.44 MB floppy drive, a minimum of 16 MB RAM, 1 serial port, 1 parallel port, a VGA port for an external monitor, an internal or external modem of at least 28.8 kbps, and either an integral mouse or an external mouse with a dedicated port. The equipment shall also include an active matrix color VGA display with a resolution of 640 by 480 pixels, and a minimum size of 22.8 cm (9 inches) measured diagonally.
 - 3.5.1 Interfaces: The equipment shall provide network interfaces as follows:
 - 3.5.1.1 LAN:
 - 3.5.1.1.1 Ethernet: BNC, AUI, and RJ-45.
 - 3.5.1.1.2 Token Ring: DB9 and RJ-45.
 - 3.5.1.1.3 FDDI: Two dual fiber MIC to allow single attached station or dual attached station.
 - 3.5.2 Status Indicators: The equipment shall provide the following soft or hard status indicators:
 - 3.5.2.1 LAN:
 - 3.5.2.1.1 Ethernet: Activity. This indicator is not required for configuration B.

- 3.5.2.1.2 Token Ring: Activity and faults. These indicators are not required for configuration B.
 - 3.5.2.1.3 FDDI: Idle, Active, Halt, Master, Noise, and Quiet. The FDDI indicators shall have separate indicators for port A and port B.
 - 3.5.2.2 WAN: T1: Frame Sync. RS-232/V.24, V.35, RS-449, RS-422, RS-423: Rx, Tx, RTS, CTS, DSR, DTR, and Int/Ext clock.
- 3.5.3 Reference: The WAN module shall be capable of selecting either the internal or external clock as the reference.

4.0 **GENERAL REQUIREMENTS**

4.1 Temperature

4.1.1 Operating: 5°C to 45°C

4.1.2 Non-operating: -10°C to 60°C

4.2 Power source MIL-PRF-28800() nominal power source requirements are invoked. Maximum power consumption: 130 Watts.

4.3 Lithium Batteries Per MIL-PRF-28800(), lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.4 Weight 10 kg (22 lbs) max.

4.5 Accessories The following accessory cables shall be supplied for each unit: One Y cable for the RS-232/V.24 interface, one Y cable for the V.35 interface, one Y cable for the RS-449 interface, and one cable for the dual bantam interface.

4.6 Quick Start Video A video tape (VHS format) showing the features and basic operation of the delivered unit configuration (A1/2 or B1/2) shall be provided with each unit.

4.7 Training A three day training course on the Configuration B (2) WAN/LAN/Ethernet, Token-Ring, FDDI unit operation shall be provided. The training materials (e.g. books, demo hardware, etc) shall be provided by the manufacturer. The training shall be conducted annually during the life of the contract at a Norfolk, Virginia and a San Diego, California Navy facility. The maximum number of students at any session shall be limited to twenty five. The time and location shall be designated annually by the contracting officer.

4.8 Test hardware and test files A removable or external 540 MB hard drive is required for each Bid sample unit. Precaptured traffic data files shall be provided on either floppy diskettes or hard drive such that all the capabilities and features of the LAN, WAN, or LAN/WAN analyzer delineated in section 3.1 can be tested and verified. This is a requirement for Bid sample units only.